

Remarks

Reconsideration of this Application is respectfully requested.

Upon entry of the foregoing amendment, claims 1, 4-11, 13-17 and 20-27 are pending in the application, with 1, 10, 17 and 23 being the independent claims. Claims 2-3, 12, and 18-19 were previously cancelled. Claims 1, 10, 17, and 23 are sought to be amended. New claim 27 is sought to be added. These changes are believed to introduce no new matter, and their entry is respectfully requested.

Based on the above amendment and the following remarks, Applicants respectfully request that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

Rejections under 35 U.S.C. § 102

Claims 1, 4, 10, 13, 17, 20, and 23-24 stand rejected under 35 U.S.C. § 102(e) as being allegedly anticipated by U.S. Pat. Appl. Pub. No. 2004/0214547 to Kim *et al.* (hereinafter, "Kim"). Claims 1, 5-11, 14-15, 17, 21-23, and 25-26 stand rejected under 35 U.S.C. § 102(e) as being allegedly anticipated by U.S. Pat. Appl. Pub. No. 2003/0178177 to Molnar *et al.* (hereinafter, "Molnar"). Applicants respectfully traverse.

Amended claim 1 recites, among other things, a plurality of submixers "configured to mix the baseband signal and individual phase-shifted LO waveforms, each submixer in the plurality of submixers being driven by a single phase-shifted LO waveform," wherein the individual phase-shifted LO waveforms "create a piecewise linear waveform approximating the LO signal when combined." Kim does not teach or suggest such features. Rather, Kim phase-shifts the received baseband signal, and then

adds the phase-shifted baseband signals to create subharmonic pulses. The subharmonic pulses are then input into the submixers. Since the baseband signal is phase-shifted prior to its input into each mixer, the mixers do not mix the baseband signal as received with a phase-shifted LO waveform, as recited in claim 1. Additionally, Kim describes inputting multiple LO waveforms into a single submixer. Therefore, the mixers are not driven by a single phase-shifted LO waveform as recited in claim 1. Further, Kim nowhere indicates that the phase-shifted LO waveforms may be combined to create a piecewise linear waveform approximating the LO signal, as recited in claim 1.

Similarly, Molnar does not teach or suggest such features. Like Kim, Molnar phase-shifts the received baseband signal, and then adds the phase-shifted baseband signals to create subharmonic pulses. The subharmonic pulses are then input into the submixers. Since the baseband signal is phase-shifted prior to its input into each mixer, the mixers do not mix the baseband signal as received with a phase-shifted LO waveform, as recited in claim 1. Further, the subharmonic waveforms of Molnar cannot be combined to create a piecewise linear waveform approximating the LO signal as recited in claim 1. Instead, the subharmonic waveforms driving the submixers, when combined, produce a square wave approximating the baseband signal.

For at least these reasons, Applicants respectfully submit that claim 1 is patentable over each of Kim and Molnar.

Amended claim 10 recites, among other things, "inputting an input signal to a plurality of submixers" and "driving a switch on each of the plurality of submixers with a corresponding one of a plurality of individual LO waveforms...wherein the plurality of individual LO waveforms create a piecewise linear waveform approximating a sinusoidal

LO signal when combined." As discussed with respect to claim 1, neither Kim nor Molnar teach or suggest inputting the input signal to a plurality of submixers, since both Kim and Molnar phase-shift the input signal before it is input to the submixers. As further discussed with respect to claim 1, neither Kim nor Molnar teach or suggest a plurality of individual LO waveforms that, when combined, "create a piecewise linear waveform approximating a sinusoidal LO signal," as recited in claim 10. For at least these reasons, Applicants submit that claim 10 is patentable over each of Kim and Molnar.

Amended claim 17 recites, among other things, a plurality of submixers "configured to mix the IF signal and individual phase-shifted waveforms to produce the baseband signal, each submixer in the plurality of submixers being driven by a single phase-shifted LO waveform," wherein the phase-shifted LO waveforms "create a piecewise linear waveform approximating the LO signal when combined." As discussed with respect to claims 1 and 10, neither Kim nor Molnar teach or suggest such features. For at least these reasons, Applicants submit that claim 17 is patentable over each of Kim and Molnar.

Amended claim 23 recites, among other things, "at least one input transistor pair configured to receive an input signal and a plurality of phase-shifted local oscillator (LO) waveforms, wherein the plurality of phase-shifted LO waveforms create a piecewise linear waveform approximating a sinusoidal LO signal," and a plurality of submixers, each submixer "being driven by a single phase-shifted LO waveform." As discussed with respect to claims 1 and 10, neither Kim nor Molnar teach or suggest such features.

For at least these reasons, Applicants submit that claim 23 is patentable over each of Kim and Molnar.

Claims 4, 13, 20, and 24 are patentable over Kim for at least the reasons discussed with respect to their corresponding independent claims, and further in view of their own respective features.

Claims 5-9, 11, 14-15, 21-22, and 25-26 are patentable over Molnar for at least the reasons discussed with respect to their corresponding independent claims, and further in view of their own respective features. For example, the Examiner states that Molnar discloses an output signal being scaled by $\sqrt{2}/2$, as recited in claim 7. Applicants respectfully disagree with such a characterization of Molnar. The reference referred to by the Examiner, paras. 260 and 263 of Molnar, merely refers to a Fourier coefficient of mixer polarity that has nothing to do with scaling the LO waveform or producing a scaled output signal. As such, Molnar does not teach or suggest an output signal being scaled by $\sqrt{2}/2$ as recited in claim 7.

Reconsideration and withdrawal of the rejection of claims 1, 4, 10, 13, 17, 20, and 23-24 based on Kim and the rejection of claims 1, 5-11, 14-15, 17, 21-23, and 25-26 based on Molnar are respectfully requested.

Rejections under 35 U.S.C. § 103

Claim 16 stands rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Molnar. Applicants respectfully traverse. Claim 16 depends from claim 10. As discussed above, Molnar neither teaches nor suggests each and every element of claim 10. Therefore, claim 16 is patentable over Molnar for at least the

reasons discussed with respect to claim 10, and further in view of its own respective features. Reconsideration and withdrawal of the rejection of claim 16 is respectfully requested.

Claims 4, 13, 20, and 24 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Molnar in view of Kim. As discussed above neither Molnar nor Kim teach or suggest certain features of the corresponding independent claims. The combination of Molnar with Kim does not cure the deficiencies of either Molnar or Kim. Therefore, claims 4, 13, 20, and 24 are patentable over Kim for at least the reasons discussed with respect to their corresponding independent claims, and further in view of their own respective features.

New claim

New claim 27 is patentable over Kim and Molnar, alone or in combination, for at least the reasons discussed with respect to claim 1 and further in view of its own respective features.

Conclusion

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

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